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# Factors Influencing the Utilization of the Mobile JKN Health Application in Indonesia

**Suci Rahmadani[1]*, Alifa Lulu Feisha[2], Sukri Palutturi[3], Balqis Balqis[4], Muh.Yusri Abadi[5]**
[1]Faculty of Public Health, Hasanuddin University, Sulawesi Selatan, Indonesia
[2]Faculty of Public Health, Hasanuddin University, Sulawesi Selatan, Indonesia
[3]Faculty of Public Health, Hasanuddin University, Sulawesi Selatan, Indonesia
[4]Faculty of Public Health, Hasanuddin University, Sulawesi Selatan, Indonesia
[5]Faculty of Public Health, Hasanuddin University, Sulawesi Selatan, Indonesia

***Corresponding Author: E-mail**: sucirahmadani@unhas.ac.id

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**ABSTRACT**

**Introduction:** The Indonesian Health Social Security Administering Agency (BPJS) has developed an information technology-based service, Mobile JKN, which can be accessed via smartphone. This application can make obtaining program services easier for National Health Insurance participants. However, utilization of the Mobile JKN application is still lacking; only 6.8% of National Health Insurance Participants in Ternate City use this application. This research aims to determine the factors related to using the Mobile JKN application at BPJS Health in Ternate City.
**Methods:** This type of research is quantitative, using an analytical survey method and a cross-sectional study. A sample of 265 was obtained by chance through direct interviews and online questionnaires on Google Forms. Univariate data analysis with frequency distribution and bivariate analysis using Fisher's exact test.
**Results:** The research found a relationship between system quality (p=0.001), information quality (p=0.000), service quality (p=0.000), user satisfaction (p=0.000), and net benefits (p=0.000) with the use of the Mobile JKN application. These findings highlight the critical role of technical and user experience factors in driving app adoption.
**Conclusion:** All research variables were related to using the Mobile JKN application. The information system for the Mobile JKN application must be developed to be more easily accessible to all groups of society. To improve utilization, efforts should focus on enhancing accessibility, user-friendliness, and digital literacy, especially for underserved populations. Strengthening infrastructure and nationwide awareness campaigns can further drive adoption. These findings provide valuable insights for policymakers and serve as a model for similar digital health initiatives globally.

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## INTRODUCTION

In 2023, Indonesia had over 200 million internet users, with a penetration rate of 78% of the total population (1,2). The average daily usage is around 4-5 hours on the internet and 2-3 hours on social media via various devices such as smartphones, computers, and tablets (3). This data illustrates the level of connectivity and digital consumption in Indonesia, emphasizing the importance of adapting to technological trends, including the shift from conventional to electronic-based healthcare systems (4). Telehealth, which uses telecommunications to provide health information and services broadly to improve public health, is recognized by the WHO in Resolution WHA 58.28 and encourages member states to develop e-health. Thailand has implemented e-Health since 2000 with applications like "MorChana" for COVID-19 tracking (5,6), while Malaysia has created the "iSayHeart" app for monitoring health and promoting a healthy lifestyle (7). These technological advancements support digital health programs in Indonesia as a cornerstone of healthcare, transforming health information systems from manual to digital (8).

Since the launch of the National Health Insurance Program (JKN) on January 1, 2014, the government has aimed for Universal Health Coverage (UHC) by 2019. UHC ensures that all citizens can access comprehensive and quality health services without financial barriers (9,10). BPJS Kesehatan is committed to providing the best service and information to the public while adapting to technological advancements. The latest innovation, Mobile JKN, facilitates JKN-KIS participants' access to administrative services anytime and anywhere (11). The Mobile JKN application from BPJS Kesehatan simplifies registration, data updates, premium checks, access to health services, and submission of complaints via smartphone. This application replaces physical cards with digital cards. Participants who do not use Mobile JKN may experience service delays due to queues at BPJS offices (12).

As of October 31, 2022, the JKN-KIS program had 245,843,917 participants. JKN participants are divided into two groups: Contribution Assistance Recipients (PBI) for the underprivileged and poor, and non-PBI for salaried workers, non-salaried workers, and non-workers, along with their family members. BPJS Kesehatan data shows that, as of May 27, 2022, the Mobile JKN application users in Indonesia totalled 16,346,826. In Ternate City, as of November 2022, out of a population of 201,916, 186,749 people (92.49%) were registered as JKN-KIS participants, but only 12,639 people (6.8%) used the Mobile JKN application (13,14). This indicates that many participants are still unaware of the administrative conveniences provided by the Mobile JKN application, reflecting ongoing barriers to its utilization, such as low awareness, technological challenges, and user preferences for in-person services. A deeper understanding of the factors influencing digital health application adoption in Indonesia is essential to address these challenges effectively.

Research by Br Sagala & Hajad indicates that the Mobile JKN application has developed well, as evidenced by its quality, multifunctionality, and uniqueness (15). The application offers easy access to information, queuing, healthcare facility changes, doctor consultations, and digital cards, with an innovative and user-friendly interface for all participant segments. Suhadi et al. revealed that Mobile JKN simplifies registration, data updates, access to information, billing, and complaints while enhancing access to BPJS services (16,17). Krisdayanti noted that although the application aligns with the program's goals, it is not yet fully effective and efficient in terms of application performance and staff (18). Prasetiyo and Safuan found that only 0.5% of participants use Mobile JKN, due to a lack of technological knowledge, a preference for visiting BPJS offices directly, and accessibility issues in remote areas (4). Despite these studies, a critical gap remains in understanding how user behavior, system performance, and localized factors influence the adoption of digital health applications in low-resource settings. This study addresses this issue by examining the key drivers and barriers to Mobile JKN adoption in Ternate City, using DeLone and McLean’s Information System Success Model as a framework.

This study applies DeLone and McLean's Information System Success Model to evaluate the adoption of the Mobile JKN application in Ternate City. According to this model, the success of an information system is determined by five key dimensions: system quality, information quality, service quality, user satisfaction, and net benefits (19). System quality and information quality assess the performance of the device and the quality of the application's information. Service quality evaluates the services expected by users. User satisfaction indicates the users' response to the application, and net benefits assess the impact of the Mobile JKN application on users (20). By utilizing this framework, the study aims to identify the key drivers and barriers influencing Mobile JKN adoption. The findings will not only contribute to a deeper understanding of digital health adoption in Indonesia but also provide actionable insights for policymakers to improve system performance and user engagement. Additionally, this study offers a

foundation for developing scalable digital health solutions in similar contexts, enhancing accessibility and efficiency in healthcare services.

## METHOD

This quantitative study employed an analytical survey with a cross-sectional design to examine factors influencing the utilization of the Mobile JKN application by BPJS Kesehatan in Ternate City. This design was chosen for its ability to analyze relationships between system quality, information quality, service quality, user satisfaction, and net benefits with application usage within a specific timeframe. The study was conducted from January to June 2023, targeting 12,639 JKN-KIS participants in Ternate City who used the Mobile JKN application in 2022. Using the Issac and Michael formula, a sample size of 265 participants was determined and selected through Non-Probability Sampling, specifically Incidental Sampling, to account for accessibility constraints. While incidental sampling may introduce selection bias due to non-random participant selection, this risk was mitigated by ensuring a diverse representation of users across different demographics and geographic locations. Additionally, self-reported data may be subject to recall or response bias; however, this was addressed by validating the questionnaire through expert review and pilot testing before implementation.

Data were collected via structured questionnaires and interviews. The questionnaire was developed based on existing validated instruments, adapted to the study context, and underwent a reliability test to ensure consistency. The research was conducted in various settings within Ternate City to capture a diverse representation of Mobile JKN users. Online methods with Google Forms (195 respondents) and offline (70 respondents) were used to accommodate the varying accessibility of participants. Ethical approval was obtained from the participants who provided informed consent, with confidentiality maintained through anonymized data.

Data analysis was conducted using univariate and bivariate methods. Fisher's exact test was employed to assess relationships between independent variables and application utilization. This test was selected over the Chi-Square test due to the latter's unsuitability when expected frequencies in contingency tables are low, which was the case in this study. Fisher's exact test is particularly appropriate for categorical data in small sample sizes, ensuring robust statistical conclusions. While the use of Non-Probability Sampling and reliance on self-reported data may introduce biases, the study mitigated these risks with robust protocols, including tool validation and adequate sample size determination, ensuring the reliability of findings.

## RESULTS

Data shows the characteristics of respondents based on gender, age, education, job, and types of health insurance membership (Table 1).

**Table 1**. Distribution Based on Respondent Characteristics

| Characteristics of Respondents | Frequency | % |
|---|---|---|
| **Gender** | | |
| Male | 106 | 40.0 |
| Female | 159 | 60.0 |
| **Age (Years)** | | |
| 18-24 | 123 | 46.4 |
| 25-34 | 67 | 25.3 |
| 35-44 | 52 | 19.6 |
| 45-54 | 20 | 7.6 |
| ≥55 | 3 | 1.1 |
| **Education** | | |
| Higher | 131 | 49.4 |
| Secondary | 129 | 48.7 |
| Primary | 5 | 1.9 |
| **Job** | | |
| Public Sector | 70 | 26.4 |
| Private Sector | 57 | 21.5 |

| | | |
|---|---|---|
| Informal Sector | 60 | 22.7 |
| Student | 78 | 29.4 |
| **Types of Membership** | | |
| Contribution Assistance Recipients | 46 | 17.4 |
| Salaried Workers | 129 | 48.7 |
| Non-Salaried Workers | 22 | 8.3 |
| Non-Workers | 68 | 25.6 |
| **TOTAL** | **265** | **100** |

The results indicate that 60% of the respondents are female. The largest proportion of respondents (46.4%) are in the 18-24 age group. In terms of education, 49.4% have attained higher education. Regarding occupation, students form the largest group (29.4%). The majority of respondents (48.7%) are salaried workers.

**Table 2**. Distribution of respondents by variables studied

| Research variable | Frequency | % |
|---|---|---|
| **System Quality** | | |
| Good | 256 | 96.6 |
| Poor | 9 | 3.4 |
| **Information Quality** | | |
| Good | 252 | 95.1 |
| Poor | 13 | 4.9 |
| **Service Quality** | | |
| Good | 254 | 95.8 |
| Poor | 11 | 4.2 |
| **User Satisfaction** | | |
| Satisfied | 252 | 95.1 |
| Dissatisfied | 13 | 4.9 |
| **Net Benefits** | | |
| Positive | 258 | 97.4 |
| Negative | 7 | 2.6 |
| **Utilization of Mobile JKN** | | |
| High | 257 | 97.0 |
| Low | 8 | 3.0 |

Table 2 shows that most respondents evaluated the key system attributes positively. System Quality was rated as good by 96.6%, Information Quality by 95.1%, and Service Quality by 95.8%. Similarly, User Satisfaction was high, with 95.1% of respondents expressing satisfaction. Net Benefits were perceived positively by 97.4% of respondents, and 97.0% reported high utilization of the Mobile JKN application. Overall, the data indicate a favorable reception across all the measured variables.

**Table 3** The relationship between System Quality, Information Quality, Service Quality, User Satisfaction, and Net Benefits to the Utilization of the National Health Insurance Service Application "Mobile JKN" in Ternate City

| Independent variables | Utilization of Mobile JKN | | | | Total | | Statistic test |
|---|---|---|---|---|---|---|---|
| | High | | Low | | | | |
| | n | % | n | % | N | % | *p-value* |
| **System Quality** | | | | | | | |
| Good | 251 | 98.0 | 5 | 2.0 | 256 | 100 | 0.001 |
| Poor | 6 | 66.7 | 3 | 33.3 | 9 | 100 | |
| **Information Quality** | | | | | | | |
| Good | 248 | 98.4 | 4 | 1.6 | 252 | 100 | 0.000 |
| Poor | 9 | 69.2 | 4 | 30.8 | 13 | 100 | |
| **Service Quality** | | | | | | | |
| Good | 250 | 98.4 | 4 | 1.6 | 254 | 100 | 0.000 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Poor | 7 | 63.6 | 4 | 36.4 | 11 | 100 | |
| **User Satisfaction** | | | | | | | |
| Satisfied | 248 | 98.4 | 4 | 1.6 | 252 | 100 | 0.000 |
| Dissatisfied | 9 | 69.2 | 4 | 30.8 | 13 | 100 | |
| **Net Benefits** | | | | | | | |
| Positive | 255 | 98.8 | 3 | 1.2 | 258 | 100 | 0.000 |
| Negative | 2 | 28.6 | 5 | 71.4 | 7 | 100 | |

Table 3 illustrates the significant relationships between key quality and satisfaction measures and Mobile JKN utilization. High ratings in System Quality, Information Quality, Service Quality, and User Satisfaction were all significantly associated with higher utilization rates ($p < 0.005$). For instance, 98.0% of respondents who perceived System Quality as good used the app adequately, compared to only 66.7% of those who rated it poorly. Similarly, 98.8% of those who perceived Net Benefits positively utilized the app effectively, whereas only 28.6% of those with a negative perception of Net Benefits did so. These findings emphasize the importance of maintaining high-quality system attributes to enhance Mobile JKN adoption.

The findings suggest that higher system quality, service quality, and user satisfaction lead to better adoption of Mobile JKN. Respondents perceiving positive net benefits were significantly more likely to utilize the application. These insights highlight the need to address barriers faced by specific demographic groups, such as older users or individuals with lower educational attainment, who may experience challenges in adopting digital health services.

## DISCUSSION

This study demonstrated that system quality, information quality, service quality, user satisfaction, and net benefits significantly influence the utilization of the Mobile JKN application in Ternate City. The observed high utilization rates (97.0%) among respondents who evaluated these factors positively reflect the critical role of digital service quality in fostering app engagement. These findings align with DeLone and McLean's information systems success model, which emphasizes the interplay of system, information, and service quality in enhancing user satisfaction and perceived net benefits (21). Uniquely, this study highlights the significant adoption rates within a localized Indonesian setting, despite challenges in digital literacy and app accessibility faced by some users.

Despite high adoption rates, certain demographic groups, particularly older users and those with lower education levels, face notable challenges in utilizing the Mobile JKN application. Factors such as limited digital literacy, inadequate smartphone access, and unfamiliarity with mobile health applications hinder effective adoption. Users from these groups often struggle with navigating app functionalities, understanding medical information, and resolving technical issues. Addressing these barriers requires targeted educational campaigns, simplified user interfaces, and enhanced customer support services tailored to the needs of different user segments. Additionally, the implementation of offline assistance points or call centers could help bridge the gap for users with limited technological proficiency.

System quality reflects how well a system performs and meets user expectations (22). It encompasses hardware and software aspects, including flexibility, reliability, ease of use, security, and access speed (23). Research results show that out of 256 respondents, 98% rated the system quality of the Mobile JKN application as good, and 2% as poor. Among those who rated the system quality as good, 98% utilized the Mobile JKN application effectively. Meanwhile, 67% of respondents who rated the system quality as poor still utilized the application adequately, although 33% did not. Statistical tests reveal a significant relationship between system quality and the utilization of the Mobile JKN application ($p=0.001$). This finding is consistent with previous studies by Narmansyah et al. and Wara et al., which indicate that system quality influences usage (20,24). Users find that the Mobile JKN app saves time and costs, offering convenience for use anytime and anywhere. Some users feel that the quality of the Mobile JKN app is lacking due to concerns about data protection, confidentiality, and security, suggesting that future improvements should emphasize enhanced encryption, two-factor authentication, and improved user data privacy policies.

Beyond the local context, these findings have implications for mobile health service adoption in other regions. Countries with similar healthcare infrastructure and digital ecosystems, such as Malaysia and Thailand, have reported comparable challenges in mobile health application uptake. Studies from these regions indicate that digital literacy

programs, multilingual app interfaces, and government-led digital health initiatives can significantly enhance adoption.

Information quality encompasses the clarity, accuracy, and completeness of information that provides new knowledge to users (22). Indicators of information quality include presentation, ease of understanding, relevance, accuracy, and availability (23). Research findings indicate that 252 respondents rated the information quality of the Mobile JKN application as good, while 13 respondents rated it as poor. Among those who rated the information quality as good, 98.4% utilized the application effectively. Conversely, 69.2% of respondents who rated the information quality as poor still utilized the application adequately. The Chi-Square test results show a significant relationship between information quality and the utilization of the Mobile JKN application (p=0.000). This study is consistent with previous research by Iskandar et al. and Mulyono et al., which state that information quality significantly affects system usage (25,26). Most Mobile JKN users believe the information provided is accurate and meets their needs. However, some users feel the app's quality is lacking because it is considered difficult to understand for certain groups, making it challenging for them to use it effectively. Good information quality enhances the utilization of the Mobile JKN application, ensuring users receive relevant and necessary information.

Service quality reflects user expectations of the Mobile JKN application, influencing their experience and future behavior (27). The study shows that 254 respondents rated the service quality of Mobile JKN as good, while 11 respondents rated it as poor. Of those who rated the service quality as good, 98.4% utilized the application effectively, indicating that good service quality enhances application utilization. Users felt that the application reduced queues at BPJS Health offices. However, some users perceived the service quality as poor due to slow responses to complaints, particularly when registering a new phone number. The Chi-Square test results indicate a significant relationship between service quality and the utilization of the Mobile JKN application (p=0.000). This study aligns with previous research by Narmansyah et al. and Mardiana (20,28). Users find the Mobile JKN app reduces queues at BPJS Kesehatan offices by providing services directly. However, some feel the app's quality is lacking due to slow complaint processing and delayed responses, particularly with registration issues and outdated data, which can lead to longer service times.

Service quality directly influences user perceptions and continued app engagement. While many users reported positive experiences with Mobile JKN, some cited slow complaint resolution and difficulties in registering new phone numbers. To address these concerns, streamlining the complaint resolution process, incorporating AI-driven chatbots for immediate responses, and offering real-time tracking for administrative processes could enhance service quality. Moreover, integrating voice-assisted navigation and language customization features could improve accessibility for elderly users and those with limited literacy skills.

User satisfaction is an indicator of the success of information system implementation, measured by the feeling of satisfaction after using the system (27,29). The study shows that 252 respondents were satisfied with the Mobile JKN application, while 13 respondents were dissatisfied. Of those who were satisfied, 98.4% utilized the application effectively, indicating that satisfaction enhances application utilization. Dissatisfied users cited issues such as efficiency, limitations of phone credit and internet quotas, and difficulties faced by elderly users. The Chi-Square test results show a significant relationship between user satisfaction and the utilization of the Mobile JKN application (p=0.000), consistent with the studies by Rahayu et al. and Masthori et al (19,30). Users satisfied with the Mobile JKN app tend to use it more frequently, feeling it effectively meets their needs. However, those less satisfied find the app inefficient and difficult to use, particularly due to limited phone credit, internet quotas, and challenges faced by older users. Overall satisfaction depends on the app’s efficiency, effectiveness, and user experience. User satisfaction is related to the utilization of the Mobile JKN application, as measured by the application's ability to meet user aspirations and needs (31).

User satisfaction is a key determinant of digital service success, measured by how effectively the system meets user expectations. The study shows that satisfied users were more likely to use the app consistently, whereas dissatisfied users faced issues such as limited internet access, lack of mobile phone credit, and usability difficulties. Addressing these pain points through partnerships with telecommunications providers for subsidized internet access, simplified app tutorials, and usability testing with diverse user groups could improve overall satisfaction.

The net benefits of an information system measure its impact on individuals, organizations, and society (32). The study shows that 258 respondents perceived the net benefits of the Mobile JKN application as adequate, with 98.8% of them utilizing it effectively. In contrast, 7 respondents felt the net benefits were insufficient, primarily due

to difficulties in administrative services. The Chi-Square test results indicate a significant relationship between net benefits and application utilization (p=0.000), consistent with the studies by Erwin and Wijaya and Syahnur et al (33,34). Users report receiving faster service with the Mobile JKN app. However, some feel the app's benefits are limited due to difficulties with administrative tasks and usability issues, preventing them from fully utilizing the app's features. Substantial net benefits enhance the success and utilization of the Mobile JKN application (35). The greater the benefits provided by a system, the higher its success rate, as measured by its impact on users.

The net benefits of the Mobile JKN application were perceived as substantial, particularly in reducing administrative burdens and enhancing healthcare accessibility. However, administrative inefficiencies remain a concern for some users, necessitating improvements in user support services and real-time assistance features.

By addressing these aspects, this study contributes to a more comprehensive understanding of mobile health application adoption. The proposed strategies for overcoming adoption barriers and improving digital service quality can inform future interventions aimed at enhancing mobile health accessibility, both in Indonesia and globally.

## Implications for Public Health

The implications of these findings are significant for public health strategies aimed at advancing digital health adoption. By addressing gaps in system quality, streamlining service processes, and tailoring information campaigns, Mobile JKN can become a pivotal tool in improving access to healthcare services in Indonesia. The high adoption rates among younger and educated users suggest that leveraging digital literacy initiatives can further enhance utilization across broader demographics. Additionally, these findings support the goals of Universal Health Coverage (UHC) and align with WHO's digital health agenda, promoting equity in healthcare accessibility through technology.

## Limitations and Cautions

While this study provides valuable insights, several limitations must be acknowledged. First, incidental sampling may have led to selection bias, as those more engaged with the Mobile JKN app were likely overrepresented, limiting the generalizability of findings. Future research should compare different sampling methods to improve representativeness.

Second, relying on self-reported data introduces recall bias, especially in subjective measures like satisfaction and benefits. Respondents may misremember experiences or respond in socially desirable ways. Combining self-reports with system usage data or qualitative interviews could provide a more accurate picture.

Lastly, the cross-sectional design prevents causal conclusions. While we identify links between system quality, satisfaction, and app use, the direction of influence remains unclear. Longitudinal studies tracking user behavior over time would help clarify these relationships. Addressing these limitations will strengthen future research.

## Recommendations for Future Research

Future studies should adopt probabilistic sampling to enhance representativeness and minimize bias. Longitudinal research is also needed to explore how system quality influences satisfaction and sustained app use, as well as its long-term impact on healthcare outcomes.

Additionally, qualitative studies focusing on underserved groups, such as the elderly or rural populations, can uncover barriers to adoption and inform more inclusive digital health strategies. Expanding research to different regions in Indonesia would also provide valuable comparative insights into Mobile JKN's effectiveness across diverse settings.

# CONCLUSION

In conclusion, this study sheds light on the factors influencing the utilization of the Mobile JKN application in Ternate City by providing valuable insights into the significant roles of system quality, information quality, service quality, user satisfaction, and net benefits. The comprehensive analysis demonstrates that high system quality, accurate information, and excellent service significantly enhance application usage, while user satisfaction and tangible benefits further motivate frequent usage. Statistical tests confirm these factors' influence, aligning with findings from previous research, thereby contributing to the growing body of knowledge on digital health application adoption.

To promote greater adoption and improve user experience, policymakers should foster partnerships between BPJS Kesehatan and local governments to implement targeted digital literacy programs, particularly for older adults and individuals with limited technological proficiency. Healthcare providers must enhance service responsiveness, streamline administrative processes, and expand multi-channel user support services. Developers should prioritize improvements such as AI-powered chatbots, voice navigation, and multilingual support to increase accessibility.

Furthermore, the Mobile JKN application is vital in supporting Universal Health Coverage (UHC) in Indonesia, aligning with WHO's digital health agenda. Mobile JKN can serve as a model for digital health innovations in other regions by continuously refining its features and addressing user challenges. Future research should explore long-term adoption trends and socio-economic factors influencing digital health utilization to develop more inclusive and effective strategies.

## AUTHOR'S CONTRIBUTION STATEMENT

All authors have made significant contributions to the research and manuscript development. Authors 1, 2, and 3 conceptualized the study, designed the methodology, and supervised the project. Author 2 and author 5 conducted the formal analysis, collected the data, and prepared the initial draft of the manuscript. Author 1 and author 4 reviewed the manuscript, provided critical insights, and handled the editing process. All authors reviewed and approved the final version of the manuscript.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest related to this study. There are no financial, professional, or personal relationships with any organizations or entities that could inappropriately influence or bias the research findings.

## DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work, the authors used generative AI solely to assist with language refinement and grammar checking. After using this tool, the authors reviewed and revised the content as necessary and take full responsibility for the final version of the manuscript.

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